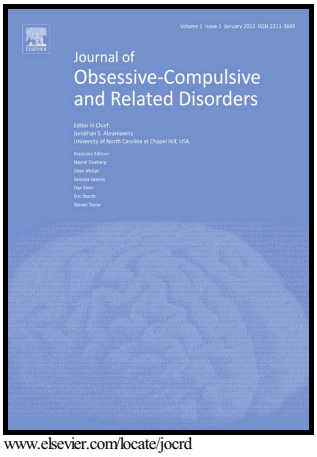


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# Cognitive Behaviour Therapy for Olfactory Reference Disorder (ORD): A case study

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## Abstract

Olfactory Reference Disorder (ORD) is preoccupation with the belief that one is emitting a foul odour. It can be a distressing and substantially impairing problem. However, very little is known about its successful treatment. This study describes the treatment of a 38-year-old female with longstanding ORD using Cognitive Behavioural Therapy (CBT). Case conceptualisation focused on identifying unhelpful beliefs and maintaining factors including safety-seeking behaviours, self-focus and avoidance. These were then targeted using a variety of techniques including discussion and behavioural experiments to facilitate belief and behaviour change. Following a 12-week treatment, measures of anxiety and depression

reduced to below clinical thresholds. In addition, there were reductions on a specific measure of symptoms of ORD. Issues regarding the use of CBT to treat this particular disorder are considered.

Keywords: Cognitive Behavioural Therapy; Olfactory Reference Disorder; Olfactory Reference Syndrome; Body Dysmorphic Disorder; Obsessive-compulsive spectrum disorders; Treatment

1. Theoretical and Research Basis for the Treatment

Olfactory Reference Disorder (ORD), also referred to as Olfactory Reference Syndrome, is a persistent preoccupation with the belief that the sufferer emits a foul and unpleasant body odour despite lack of evidence to the contrary. ORD can be accompanied by olfactory hallucinations, although 59% of sufferers report not smelling the odour themselves (Begum & McKenna, 2011). It is characterised by persistent attempts to mask the odour and/or avoid social contact with others (Greenberg, Shaw, Reuman, Schwartz, & Wilhelm, 2016; Veale & Matsunaga, 2014). Evidence suggests that the symptoms of ORD are accompanied by clinically significant distress (Feusner Phillips & Stein, 2010; Greenberg et al., 2016), impairment of functioning (Bishop, 1980; Davidson & Mukherjee, 1982; Greenberg et al., 2016; Malasi, el-Hilu & Mirza, 1990) and social disability (Greenberg et al., 2016; Pryse-Philips 1971). Onset tends to be in early adulthood and the problem can persist if untreated (Greenberg et al., 2016).

The precise diagnostic classification of ORD has been the subject of some debate. Following the proposal that it is best understood as a hypochondriacal form of delusional disorder, ORD was previously placed within delusional disorder somatic subtype within DSM-IV (Munroe, 1988). Similarly, ICD-10 refers to convictions about emitting a foul body odour

within descriptions of delusional disorder, somatic type. Ideas of reference were reported in 64% of a recent sample (Greenberg et al., 2016). However, it has been observed that ORD can occur with and without insight, and that the phenomenology of the disorder (i.e. checking, masking, reassurance seeking and avoidance behaviours) bears more in common with anxiety based disorders (Feusner et al., 2010; Greenberg et al., 2016, Veale & Matsunaga, 2014). ORD has some overlapping symptoms with body dysmorphic disorder, obsessive-compulsive disorder and health anxiety (Feusner, et al., 2010). In addition, it bears some similarities to social anxiety, in that it is marked by fears of, and attempts to avoid, humiliation and social rejection (Veale & Matsunaga, 2014). However, it differs from all these disorders in terms of the cardinal preoccupation with emitting an odour. Subsequently, recommendations have been made for 'olfactory reference syndrome' to be placed alongside Obsessive-compulsive disorders within the American Psychiatric Association's Diagnostic and Statistical Manual (DSM-5; APA, 2014; Fuesner et al., 2010). However, it was not classified as a distinct disorder in DSM-5 despite these recommendations. In addition, the planned 11th edition of the International Classification of Diseases (ICD 11) will have a new diagnosis of Olfactory Reference Disorder, which will be included within OCD and related disorders.

The research evidence on mechanisms and treatment of ORD is scant. Interventions using pharmacotherapy have been reported using SSRIs or SSRI with antipsychotic augmentation (Dominguez & Puig, 1997; Michael, Boulton, & Andrews, 2014; Stein, Le Roux, Bouwer, & Van Heerden, 1998) but only three case reports using psychological therapy have been reported, two with successful use of an exposure and response prevention rationale (Martin-Pichora & Antony, 2011, Zantvoord, Vulink, & Denys, 2016) and a case series utilising EMDR (McGoldrick, Begum, & Brown, 2008). Disorder specific treatment guidelines

do not yet exist. Furthermore, a comprehensive cognitive model for ORD has yet to be developed. Due to some core similarities with body dysmorphic disorder (BDD) the cognitive behavioural model of BDD and protocol for treating BDD with cognitive behaviour therapy (CBT) can be used to inform treatment (Veale & Neziroglu, 2010). Elements from the cognitive model of OCD can also be utilised (Salkovskis et al, 1997).

In brief, the CBT approach to treating BDD involves developing a shared understanding of the disorder, firstly by eliciting idiosyncratic meanings of the perceived physical deficit. Excessive self-focus and safety seeking behaviours such as social avoidance, camouflage and checking that maintain this negative appraisal are identified, explored and modified through cognitive restructuring and behavioural experiments aimed at testing assumptions.

The current case study adds to the literature by guiding the reader in detail through treatment using these methods. The particular focus of this study is on belief change rather than a pure exposure rationale as in previous CBT case studies and detail is given on the client's specific beliefs and their modification. Uniquely, insight is also given into the perspective of the client. The client in this study is not on any medication and this study provides initial evidence for the effectiveness of CBT as a stand-alone treatment. Furthermore, this study presents a new clinically useful measure of ORD.



## 2. Case Introduction

Lisa was a 38-year-old white British woman who was referred to a United Kingdom primary care Improving Access to Psychological Therapies (IAPT) service due to excessive and persistent concerns about her breath smelling.

Lisa was a researcher working in the field of education. She enjoyed and was able to function in this job with the exception of a single two-week period when her anxiety had prevented her from working. However, she found close interactions with colleagues difficult and her problems had affected her choices at work. Her fears were affecting the quality of her life. At the time of treatment, she lived alone. She had a partner of two years who she described as 'supportive' and had good relationships with her parents who separated during her childhood.

Lisa's main problem was a longstanding fear that her breath smelt. She had believed this for some time without disclosing it to anyone. Prior to treatment, she confided in significant others such as her mother who all disconfirmed this; however, her fears persisted. She described experiencing a burning sensation in her mouth and throat, which reinforced her belief. Lisa described being very preoccupied with concerns about her breath and this affected her ability to enjoy and engage in social activities. She reported avoiding intimacy and social interactions that involved any degree of close physical proximity to others. If proximity was inescapable she employed several strategies to minimise her fears; such as avoiding talking, turning her head away, holding her breath, and talking on an in breath. During such interactions Lisa closely scrutinised the reactions of others, she would monitor if they wrinkled their nose, touched their face or moved away from her. These clues were interpreted as confirmation of the problem. Lisa reported regularly checking her breath and using mints and gum to mask her breath. At the time of treatment, she was a smoker, which she continued as she felt it provided a specific reason for her breath to smell.

In the past Lisa sought medical testing to investigate possible food allergies, and had her tonsils removed due to her unconfirmed fears of food trapping, which can lead to bad breath. All tests were negative and her fears persisted despite these procedures. Lisa's level

of insight at assessment was best described as variable; although at times she acknowledged the possibility that her breath did not smell, she described complete conviction in this belief when perceiving a foul odour during a social interaction.

In terms of past treatment, she had received a 6 session course of CBT and attended several counselling sessions 3 years previously, but her symptoms persisted and continued to have a marked impact on her functioning. Lisa's description of previous treatments indicated that the therapeutic focus had been on exploring the historical causes of her symptoms and therefore current maintaining factors were not identified and challenged. The 'CBT' described may therefore not have been adequate. She was not taking any psychotropic medication for her difficulties.

Lisa did not report any current of past suicidal ideation or self-harm and did not disclose any indication of risk of harm to others. Risk was reviewed regularly and remained low throughout the treatment.

This initial assessment concluded that Lisa's difficulties were consistent with a diagnosis of Olfactory Reference Disorder (ORD) based on ICD-10 criteria and were suitable for a 12 week course of CBT. Lisa underwent a full diagnostic screening interview at assessment. She did not meet criteria for any other disorder.



3. Assessment

Symptoms were assessed weekly using the standard IAPT service outcome measures, the GAD-7 (Spitzer et al, 2006) is a well validated and widely used measure of anxiety and the PHQ-9 (Kronke et al, 2001) is well validated and used to measure depression. A change of 4 or more on the GAD has been found to be clinically significant across anxiety disorders

(Gyani, Shafran, Layard, & Clark, 2013). In addition; the Appearance Anxiety Inventory (AAI, Veale et al., 2014) and Body Dysmorphic Disorder Dimensional Scale (BDD-D, Le Beau et al., 2013) were completed at three points during treatment.

The AAI is a self-report scale developed to identify the cognitive processes and behaviours that might mediate the outcome of treatment in people with Body Dysmorphic Disorder (Veale et al., 2014). The measure consists of 10 items with a range of 0 to 40. The AAI has been found to have good test-retest reliability and convergent validity in the measurement of appearance anxiety (Veale et al., 2014).

The BDD-D is modelled on the Florida Obsessive Compulsive Inventory. It has 5 items and the range is 0 to 20. It has been shown to have strong internal consistency and good convergent and discriminatory validity (Le Beau et al., 2013).

Due to the lack of a validated measure specifically for Olfactory Reference Syndrome an ORS questionnaire (ORD-Q) was developed for clinical use from a list of online screening questions found on the OCD Centre of Los Angeles website. (http://ocdla.com/olfactoryreferencesyndrome, see appendix). The list includes distress, beliefs and behaviours relevant to ORD. The measure requires respondents to rate how frequently the item has occurred over the past week on a five point Likert scale.

Measures of BDD were included due to some crossover of symptoms with BDD such as preoccupation, distress and compulsions. The BDD-YBOCS was used in the other case studies (e.g. Zantwoord et al 2016 and Martin-Pichora & Antony, 2011) and detected change. Inclusion of BDD measures both allowed for some comparison with the existing literature and enabled a direct comparison with the ORD specific measure in this study.

4. Case Conceptualization

Treatment began by discussing a recent incident during which Lisa was concerned about her breath; this was explored in detail in order to construct a 'vicious flower formulation' (Salkovskis, 1985). The incident took place whilst Lisa was presenting a research proposal to a new person in an unfamiliar environment. She detected an unpleasant smell within the room and attributed it to herself which caused high levels of anxiety and distress. This formulation provided a framework to examine potential links between Lisa's intrusive thoughts, meanings ascribed to these thoughts, emotions and maintaining factors. We observed that the central meaning within the formulation focused on a fear of disgusting others and being unlikable. A shared formulation using Salkovskis et al's (1997) integrated schematic model was developed to inform the intervention (see Figure 1 below).

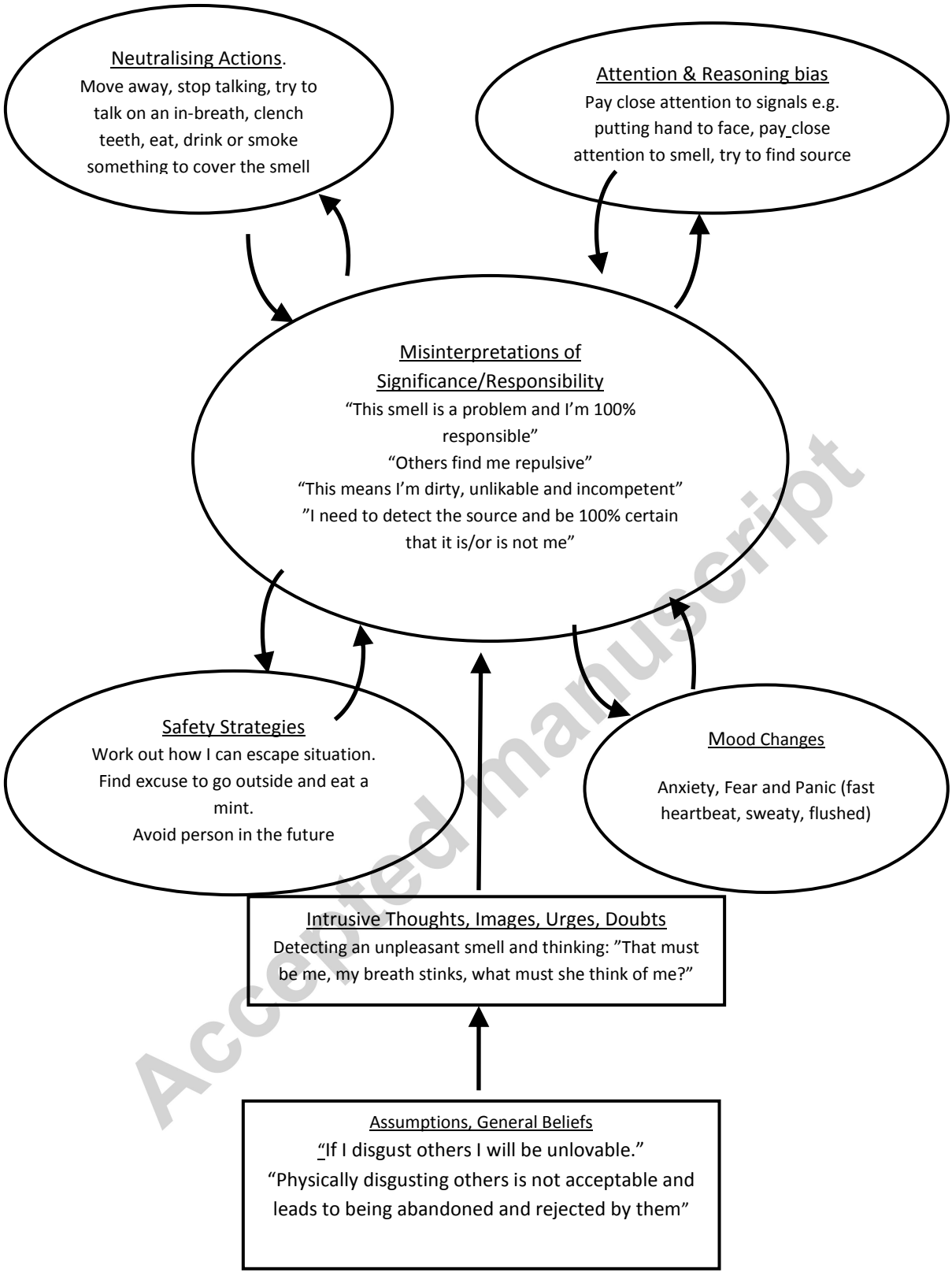

Fig 1: Integrated cognitive formulation of Lisa's presenting problem based on the diagrammatic model provided by Salkovskis, Forrester & Richards, (1997)

The first session was also used to establish Lisa's goals for treatment. Her initial goal for treatment was to never have the intrusive thought 'my breath smells and others will notice'. However, after conducting a brief thought suppression experiment (using the Wegner et al., 1987 'white bears' example), Lisa adjusted this goal. At the end of treatment, she wanted to be able to seek out and tolerate physical proximity to others without becoming overwhelmingly distressed and distracted by concerns about her breath.

Lisa's baseline BDD measure indicated a mild problem (see figure 2). It is possible that this may have been an underestimation due to her habitual avoidance of stressful situations. However, Lisa indicated that she did not believe the measures of BDD fully captured her particular experiences as they focused on concerns about physical appearance rather than smell. As described, the un-validated ORD measure was therefore provided to be a clinically targeted assessment of her current difficulties.

5. Course of Treatment and Assessment of Progress

An intervention comprising 12 sessions of individual CBT was arranged, some of which were longer than one hour to accommodate behavioural experiments. Due to Lisa's plans to emigrate during the treatment period, the final session and follow up was conducted over Skype™. All sessions were conducted by a clinical psychologist in training under the supervision of a qualified senior clinical psychologist.

Sessions 2 and 3 began by exploring Lisa's observation that she looks out for small behavioural cues when talking to others (e.g. turning their head away, frowning, touching

their face with their hands) and interprets these as confirmation that her breath smells. She acknowledged that this often made it hard for her to accurately test out her beliefs about her breath and hypothesised that there may be other more benign explanations for their behaviour. However, when she was talking to others and perceiving an unpleasant smell she found these alternative explanations harder to access.

Alternative explanations were further explored by collaboratively developing two competing accounts of Lisa's presenting problem using the Theory A and Theory B technique. Lisa provided a detailed account of Theory A (the problem is my breath smells bad and it disgusts and repels others). By comparison Theory B proposed that the problem is that Lisa is excessively worried and preoccupied by the smell of her breath and spends a lot of time trying to manage it. She initially rated her belief in Theory A as 60%. Evidence to support both theories and their implications if true were examined (see Table 1).

Table 1 Theory A and B table using the dual model strategy (Wells, 1997)

| Theory A | Theory B |
|---|---|
| The problem is my breath smells and it repulses others<br><br>Evidence<br>• In the past people have hinted that my breath smells<br>• I have physical symptoms such as burning in my mouth<br>• When I sniff my dental floss it smells<br>• When I talk to people they move away from me and rub their noses | The problem is I worry that my breath smells and I'm preoccupied with the idea that it repulses others.<br>Evidence<br>• People who I'm close to have told me that my breath doesn't smell and I don't have a problem<br>• I have undergone medical tests that have not found any problem<br>• I notice the smell more when I'm anxious and worried |
| What do I need to do if Theory A is true<br>• Always avoid any physical closeness to other people<br>• Spend all of my time on my own<br>• Always mask my breath<br>• Continue to seek medical help in the hope of finding a cure | What do I need to do if Theory B is true<br>• Find ways to manage worry and preoccupation<br>• Don't allow my concerns to interfere with my behaviour - Get on with enjoying my life<br>• Keep talking to people and make the |

| | |
|---|---|
| | most of opportunities to make new friends |
| What this would mean for my future<br>• A solitary life where I don't meet new people - Limited work opportunities<br>• Accept I will never feel free to do what I want<br>• Never take risks or try new things<br>• Never meet the right man, settle down or have kids | What this would mean for my future<br>• Have an active social life with lots of friends<br>• Be good at my job and take on new challenges<br>• Meet a man and perhaps start a family |

The 'builders apprentice' metaphor (Stott et al, 2010, p.137-8) was used to illustrate how some of Lisa's safety seeking behaviours and attentional biases were preventing her from disconfirming her beliefs. In order to further explore the belief that people who turn their head way, touch their nose or frown are disgusted by Lisa's breath, she was asked to monitor a 2-minute interaction between two people and to count the number of times these things occur in a 'normal' interaction.

Sessions 4 and 5 were devoted to reviewing and building on findings from this homework task. Lisa noted that people touched their noses, frowned and turned away from each other more than twice as frequently as she had predicted. This observation led Lisa to query whether these 'clues' reliably indicated that her breath smelt. She also shared an increased awareness of her tendency to seek out smells and observe reactions in others. This was reviewed in relation to the shared formulation and how her central fears lead to an increased focus of attention on smells and physical cues, which in makes it more likely for her to perceive them. This was further illustrated using the 'anthrax pigeon' analogy (asking how many pigeons she spotted on the way to the clinic and comparing this estimate with how many she may have detected if she believed they carried a deadly virus).

In exploring Lisa's beliefs about bad smells, Lisa recalled occasions when her friends had behaved in a way that may be seen as 'disgusting' (e.g. being publicly sick or kissing people in the street). Lisa noted that this did not make them repulsive or unlikable to her, but she believed this was different from her own concerns as she was able to attribute their actions to one off events. In contrast she believed that if her breath smelt, people would attribute this to something enduring and fundamental about her (i.e. she was unclean, slovenly and had no self-awareness). This led to the compilation of a list of all the actions someone may do if they believed this about her. In doing this Lisa observed that they bore a striking resemblance to her own safety behaviours (i.e. avoidance of physical proximity, trying to avoid sharp intakes of breath, turning their head away whilst speaking). Lisa reflected on this and whether her behaviour may be prompting others to mirror her distance within social encounters.

Lisa's avoidance of physical proximity was operationalised by measuring her 'comfort zone'. This was achieved by conducting a conversation whilst standing increasingly closer until she felt discomfort. This exercise established she was comfortable at a distance of approximately 45 centimetres (1.5 feet). For homework Lisa was encouraged to try standing within this zone during one social interaction and to do so without performing any of her safety seeking behaviours (SSBs). Her belief that the other person would be disgusted and wish to stop the interaction was tested by eliciting explicit behaviours that would demonstrate this (such as the person immediately ending the conversation or walking away). Lisa rated her belief in the likelihood that this would happen at 70%.

Lisa conducted this behavioural experiment by talking to a stranger on a busy train without engaging in any of her identified SSBs. She noted surprise that the passenger continued to

talk and did not look down or attempt to stop the interaction. Lisa's belief that the person was disgusted and wished to end the interaction reduced to 40%. We reflected on the fact that this belief persisted at 40% despite clear evidence to the contrary. This led us to explore Lisa's belief that this may have been a one-off incident, or that perhaps her breath was not as bad that day. Following Socratic questioning Lisa concluded that she would need to test this belief out with more people.

During session 6 an in-session behavioural experiment was conducted to test out the belief 'my breath repels others' (40%) by going into a busy high street and talking to passers-by whilst standing less than 1 foot away and not performing any identified SSBs. This was modelled first by the therapist asking for directions and wherever possible continuing the conversation. This was repeated this several times with different people and the reactions of others were assessed by filming the encounters on Lisa's smartphone. Session 7 was used to review video feedback gathered to compare the number of times people touched their face, stood back, turned their heads away, or wrinkled their noses when either the therapist or Lisa spoke to them. Lisa noted that there were no observable differences between the interactions and commented that one lady clearly stood back when the therapist was talking to her. It was helpful for Lisa to note that she did not believe this was because she was repulsed.

Following this experiment Lisa re-rated her belief as 20% and concluded that the 'clues' she had been looking for were not indicators of repulsion, but commonly occur in conversation with strangers (stand back to re-establish personal space). In addition, Lisa observed that she enjoyed talking to some of the people and noted that she has 'missed out on lots of nice chats' with people due to her avoidance.

During sessions 8 and 9 Lisa enquired whether concerns regarding breath were 'normal'. This was explored by devising a 'breath survey' anonymously completed by 10 people. Questions included "Do you ever worry about how your breath smells?", "When you notice that another person's breath smells, does it change how you feel about them?" and "Do you regularly do anything to manage the smell of your breath?"

The results of the survey showed that 100% of respondents reported worrying about their breath at some point, with the vast majority indicating that this occurred 'sometimes' rather than 'rarely'. Lisa noted that all respondents reported attributing the noticeable bad breath of others to external factors such as eating something with a strong smell or being unwell, rather than it indicating something fundamental about them as a person or that they had poor hygiene. Lisa concluded that the thought 'I wonder if my breath smells' is a common and 'normal' concern, but that bad breath did not appear to be universally repulsive for everyone. For her these thoughts appeared to have a meaning (i.e. that she is unlikable, slovenly, not self-aware) that were not necessarily shared by others.

Sessions 10 and 11 were devoted to reviewing treatment; Lisa observed that the outdoor behavioural experiment enabled her to see that physical distance was not exclusively a sign of repulsion, but it did not directly test out her persisting belief that when in close proximity to others her breath would repulse them. Therefore, to provide a more rigorous test for this belief a final behavioural experiment was conducted within the clinic. During this experiment Lisa knelt down next to a volunteer who was unaware of her difficulties whilst they sat at a desk, to teach them a novel computer task (this was conducted three times using three different volunteers of varied age and gender). This activity involved talking directly into the faces of volunteers whilst not engaging in any SSBs

After this interaction each volunteer completed a brief survey to assess their levels of comfort and disgust during the task. Survey questions included “How comfortable did you feel being next to Lisa?”, “Did you notice any smells or odours during the task?” and “How disgusted were you whilst doing the task?”. The results of this survey showed that all volunteers felt comfortable, found Lisa friendly and did not report noticing any smells, Lisa's breath, or any level of disgust.

Following this experiment Lisa reported a marked reduction in her concerns. This was consistent with change on her outcome measures (see figure 2). She observed that placing less importance on whether she smells or not resulted in her feeling less preoccupied with this concern. Lisa concluded that one of her core discoveries was that her interpretation of others actions as evidence of repulsion were false. She shared that discovering this allowed her to take more risks and use opportunities to speak to people whilst dropping her SSBs. Lisa also described that she found the survey a useful part of therapy as she believed it showed her that 'bad smells don't change how people feel'.

At the end of treatment Lisa reported discounting Theory A (0%) and no longer believing that her breath was a concern. However, she communicated some anxiety about her symptoms re-emerging in times of stress. Therefore, the last session was used to consolidate the shared understanding of the problem and to devise a therapy summary (blue print).

A joint final and follow up session was conducted over Skype™, 10 weeks after the end of weekly treatment. Lisa reported doing well and settling into life in a new country. She was continuing to engage in conversation with people without performing any SSBs. In addition she reported that she had stopped smoking and maintained this for 6 weeks. Her session 12 follow up scores on outcome measures showed sustained improvement (see figures 2 & 3).

She described a small increase in awareness of physical symptoms (burning throat and mouth). Following a brief attentional focus experiment (where Lisa focused on different parts of her body) the role of attention and threat appraisals in noticing physical symptoms were discussed. Lisa reported using her therapy blueprint since her move and feeling confident in referring to it for guidance if her symptoms re-emerged in the future.

Symptoms were assessed weekly using the standard IAPT dataset (PHQ-9, GAD-7, WSAS). In addition, disorder specific measures (AAI, BDD, and ORD-Q) were taken at several points throughout treatment. Scores on these measures can be seen below, in Figures 2 & 3.

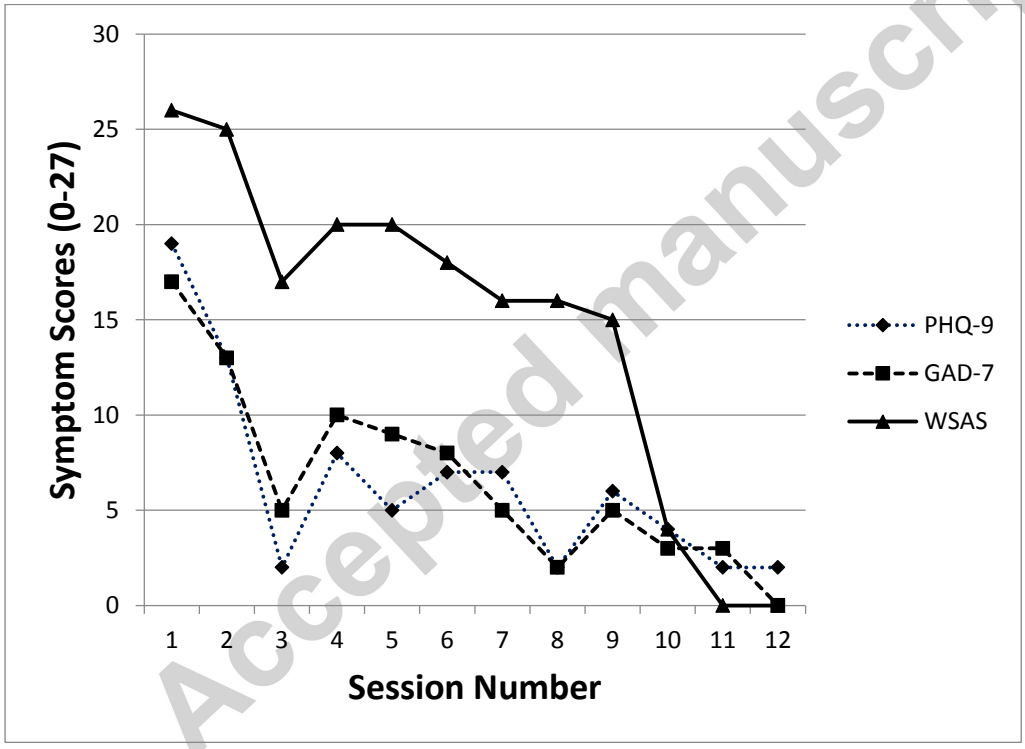




Fig 2: Weekly depressive (PHQ-9), and anxious (GAD-7) symptoms and Work and Social Adjustment Scale (WSAS) taken from the IAPT minimum data set

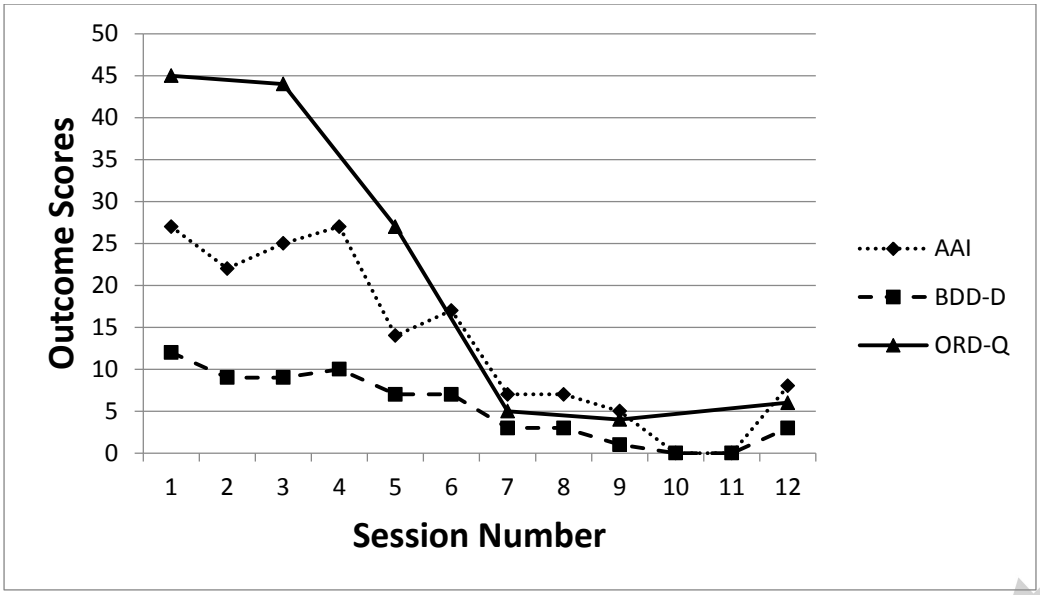


Fig 3: Scores for Appearance Anxiety Inventory (AAI), Body Dysmorphic Disorder Dimensional Scale (BDD-D) and Olfactory Reference Disorder Questionnaire (ORD-Q)

As can be seen from figure 2, Lisa initially reported 'severe' anxiety (GAD 7 above 15) and 'moderately severe' depression (PHQ 9 above 15) and her difficulties were having a marked impact on her work and social functioning (WSAS Score). These reduced throughout treatment with a small increase during week 4. When discussed, this increase was attributed to an argument that she had with her father and the stress of arranging her move abroad.

As figure 3 shows, Lisa's concerns about her appearance and symptoms of BDD also reduced throughout treatment. The largest change was on the specific measure of olfactory reference disorder (ORD-Q) which reduced from 45 to 6.

6. Treatment Implications of the Case

The current case demonstrated positive outcomes for ORD following a 12 week course of CBT which were sustained at one month follow up. The intervention was informed by empirically supported CBT approaches to treating BBD and OCD and these appeared to have translated well to similar concerns about breath.

Throughout treatment similarities with key features of BDD were apparent, in particular the role of maintenance factors such as masking, checking and avoidance. The success of the adapted treatment approach and the reductions in scores on measures of appearance anxiety and BDD further support the overlap between BDD and ORD. However, some adaptations to treatment were necessary to address Lisa's specific concerns. Notably Lisa's symptoms differed from BDD in that the perception of her deficit was sensory rather than physical and possibly hallucinatory. Subsequently, the focus of treatment was on Lisa's appraisal of this sensory experience and its predicted impact on the behaviour and judgement of others.

Although the measures of BDD reduced throughout treatment the most notable change was on the specific measure of olfactory reference symptoms (ORD-Q). Lisa reported that the items on this measure were more personally relevant and easier for her to answer. This finding indicates that the development of a reliable and valid measure of olfactory experiences and beliefs will be helpful to target and evaluate therapy for ORD.

People with ORD may be understandably reluctant to disclose their difficulties and seek help. In conclusion, we are present Lisa's own words on her experience of treatment and what she would say to others considering CBT for ORD. These are reproduced with her permission:

"I had almost given up on ever finding effective treatment for my problem. I remember thinking 'well, this is just me and I have to learn to live with it'. For the first time in years I do

not think of my 'monkey on the back' every moment of every day. In fact, I rarely think about it now, and when I do it is an entirely different experience that is no longer threatening but something I can brush away like a pesky fly. The therapy I received gave me a new way of looking at my problem, and a realisation that I am not mad. It has given me strategies to challenge my beliefs and meet my problems head on (and defeat them!). It was hard at times, particularly the experiments we developed to challenge my beliefs - I did things that I would never have pictured myself doing, and found myself in situations at times that were way out of my comfort zone - but they were all worth it as I feel like a different person. I cannot thank [your clinic] enough, and would urge anyone who is considering treatment to go for it. It may be the best thing you ever do."

7. Recommendations to Clinicians and Students

We present a case of successful use of Cognitive Behavioural Therapy (CBT) in the treatment of Olfactory Reference Disorder (ORD). There is no pre-existing treatment protocol for this disorder. This study demonstrates that empirically supported CBT approaches to treating BDD and OCD translate well to treatment of ORD and guides the reader through the application of this approach. Techniques such as Theory A/B, behavioural experiments, surveys and video feedback were useful to change the beliefs maintaining ORD. This study provides evidence that CBT significantly reduces core symptoms of ORD in addition to depressive and anxious symptoms. Whilst some change can be detected on the BDD YBOCS, symptomatic change is best assessed using an ORD focused measure. A limitation of the study was the reliance on self-report measures to assess change. Future research should focus on the development and validation of client and clinician rated measures specific to

ORD, as well as evaluations of therapy effectiveness with larger samples. Research characterising populations of people with ORD may further understanding of the causes of this problem and contribute to better methods of detection of ORD. This could help facilitate access to treatment in a timely way.

# Appendix

ORD questionnaire

Please tick the box that best describes the way you have felt about your body odour OVER THE PAST WEEK, INCLUDING TODAY.

| | | Not at all | A little | Often | A lot | All the time |
|---|---|---|---|---|---|---|
| 1 | I worry about the way I smell. | | | | | |
| 2 | I check my odour by smelling myself. | | | | | |
| 3 | I excessively perform basic grooming activities (i.e. showering, brushing teeth, changing underwear, changing socks etc.) in an attempt to control my odour. | | | | | |
| 4 | I use perfume, deodorants, mouthwash, and/or special hygiene products to control or camouflage my odour. | | | | | |
| 5 | I attempt to hide my odour by maintaining certain body positions, and/or by staying in places where I believe my body odour will be less noticeable by others (e.g. a remote corner in a theatre or restaurant). | | | | | |
| 6 | I stand at a distance when around others because I am concerned that they will detect my body odour. | | | | | |
| 7 | I avoid certain places and/or activities (e.g. restaurant, parties, weddings, socializing with friends, going shopping etc.) because I am concerned that others will detect my odour. | | | | | |
| 8 | I avoid exercising because I am afraid it will cause me to have a bad odour. | | | | | |
| 9 | I avoid certain foods in an attempt to control how I smell. | | | | | |
| 10 | I smell others' odour for comparison. | | | | | |
| 11 | I discuss my odour with other people. | | | | | |
| 12 | I ask others for reassurance about my odour. | | | | | |
| 13 | I have consulted with specialists (e.g. doctors, dentists) regarding my odour. | | | | | |
| 14 | I have undergone special medical or dental procedures in an attempt to correct my | | | | | |

odour.

15 I think about having odour-related medical or dental procedures in the future.

16 I am late for activities because I am doing certain behaviours in an attempt to control my odour or I am worrying about my odour.

17 I am very anxious when I fear my odour will be smelled by others.

18 I believe others notice my odour and/or are thinking negative thoughts about the way I smell.

19 I sometimes think others are discussing or commenting on my odour.

20 I am significantly distressed, anxious, and/or depressed about my odour.

21 My concerns about my odour are interfering with my relationships and/or with my ability to get on with studying/work.

22 I spend hours per day thinking about my odour.

23 I spend hours per day doing behaviours specifically related to my odour.

I worry most about the following odours:
1)
2)
3)

Based on the Olfactory Reference Syndrome test from website of OCD Center of Los Angeles



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